

SUMMARY FOR FE-16-02
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Burlington Northern Santa Fe Corporation

Location: Memphis, Tennessee

Region: 3

Month: June

Date: June 16, 2002

Time: 3:15 p.m., CST

Data for Fatally Injured Employee(s)

Yard Foreman

20 years of age

One year, six months of service

Last rules training: Feb. 26, 2001

Last safety training: Feb. 26, 2001

Last physical: Jan. 15, 2001

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation and Engine

Positions:

Crew of Yard Job No. 173

Engineer

Foreman

Helper

Yard Master

Utility Employee

Activity: Switching

EVENT

A Yard Foreman was fatally injured when struck by moving equipment,
while conducting switching operations.

SUMMARY FOR FE-16-02 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

PCF No. 1

The investigation revealed that when the Foreman tried to re-couple a 54-car cut to a 23-car cut (by shoving the 54-car cut into the 23-car cut), the knuckles mismatched, a situation about which the Foreman apparently was unaware as he did not double check the coupling before his next step.

PCF No. 2

As the Foreman subsequently (and prematurely) released the hand brake on Hopper Car MLLX 105108 of the 23-car cut, he was struck by Car MLLX 10232 of the 54-car cut, and the 23-car cut rolled away 863 feet.

PCF No. 3

The Foreman was inexperienced, at 20 years of age and with only one year, six months of service.

REPORT: FE-16-2002

RAILROAD: Burlington Northern Santa Fe Corporation

LOCATION: Memphis, Tennessee

DATE & TIME: June 16, 2002; 3:15 p.m., CST

EVENT¹: The Yard Foreman was fatally injured when struck by moving equipment, while conducting switching operations.

EMPLOYEE:

Craft:	Transportation and Engine (T&E)
Activity:	Switching
Occupation:	Yard Foreman
Age:	20
Length of Service:	1 year, 6 months
Last Rules Training:	Feb. 26, 2001
Last Safety Training:	Feb. 26, 2001
Last Physical:	Jan. 15, 2001

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On June 16, 2002, at 7:59 a.m., CST, after completing a statutory off-duty period, an Engineer, Foreman, and Helper went on duty at the Tennessee Yard, Memphis trimmer office. They were assigned to Yard Job No. 173 for that duty period. The crew conducted switching operations for the first part of their shift by pulling cars from the class yard and shoving them into the outbound train yard. At approximately 1:30 p.m., the crew of Job No. 173 was instructed by the Yard Master to double class Yard Tracks Nos. 33, 27, 31, 36, and 45 to make up Train H-MEMCVE1-116A. They were instructed to build the train on Track No. RD-7 and clear the crossover between Tracks Nos. RD-7 and RD-8. The crew conducted a job briefing, discussing their instructions from the Yard Master, and then proceeded to carry them out.

At approximately 3 p.m., the crew had completed building the train on Track No. RD-7. A Utility Employee was attached to the crew for the purpose of watching the South end of Track No. RD-7. After performing that duty, the Utility Employee detached from the crew of Job No. 173. The Helper on the locomotive received permission from the Engineer to go between

¹ “Event” is defined as “occurrence that immediately precedes and directly results in the fatality.” Possible contributing factors are identified in the following report and attached summary.

equipment as required by BNSF Safety Rule S-13.1.1, Going between Cars or Locomotives Coupled to a Locomotive (a.k.a., set and centered), so that he could apply hand brakes on the north end of the cars. The Job No. 173 Foreman then walked into the trimmer office where the Yard Master asked him if he had cleared the crossover switches between Tracks Nos. RD-7 and RD-8. The Foreman stated he had not. The Yard Master then instructed the Foreman to get back with his crew and clear the RD-7 crossover switch. The Foreman radioed the Engineer and Helper and told them they needed to clear the crossover and that he would get back to them in a few minutes. The Utility Employee, who had been attached previously to the crew of Job No. 173, radioed the Foreman, and asked if he was going to need him to help clear the crossover switch. The Foreman stated to the Utility Employee that he would take care of it and would use a 4-wheel, all terrain vehicle (ATV) to ride to the crossover.

The Foreman arrived at the crossover via ATV and parked between Tracks Nos. RD-7 and RD-8. The Foreman radioed the Engineer for protection as required by carrier rule S-13.1.1, and the Engineer answered him by stating the usual phrase, "Set and Centered," which meant the locomotive reverser was centered and the brakes were in full application. The Foreman applied one hand brake on Car MLLX-105108, which was the north car of the 23 cars to be left standing south of the RD-7 crossover switch. The Foreman radioed the Engineer to release the 3-step protection. The Engineer answered him by saying, "OK, released." The Foreman then radioed the Engineer and gave instructions for the Engineer to "ease him a little slack" so he could pull the pin lever. The slack reached the car where the Foreman was located. He pulled the pin lever and instructed the Engineer to stop and pull north six or seven car lengths. The Engineer pulled north about six car lengths, and the Foreman asked how much room he had left at the north end. The Engineer answered him by saying he had about two car lengths. The Yard Master overheard the radio conversation of the Job No. 173 crew and radioed the Foreman, instructing him to re-couple and leave a couple of cars lengths so the north end could clear three locomotives. The Foreman radioed the Engineer and told him to stop the movement and shove the car south six lengths to a coupling. The Engineer stopped and then started the shove to a coupling. The Foreman gave a proper car count in car lengths to the coupling, and then the Foreman told the Engineer in a normal voice, "That's far enough; stop."

The Memphis Terminal Tennessee Yard was located between Milepost 394 and Milepost 397. The Tennessee Yard had 54 class tracks, six intermodal tracks, and 14 departure yard tracks which lay geographically north and south. There were two main tracks leading into the yard from the north and two mains leaving to the south. The Main Tracks Nos. 1 and 2 combined handled 250 to 300 million gross tons yearly. The tracks other than the main tracks were limited to restricted speed. The subject Track No. RD-7, a departure track which could hold about 110 cars, descended slightly from the north to the south for about 60 car lengths and then ascended slightly for the next 50 car lengths. The track was tangent for about 54 car lengths from the north and then made a slight left-hand curve for about five car lengths, tangent for about 11 car lengths, and then with a slight right hand curve, and tangent for the next 40 cars. The area of the accident scene was clean without any slipping or tripping hazards.

At the time of the accident, the temperature was 94° F, and the weather was clear.

THE ACCIDENT

After the Foreman had radioed to stop the movement, the Utility Employee who was previously attached to Job No. 173 observed cars rolling south on Track No. RD-7. He immediately radioed the Yard Master and asked him about the cars on Track No. RD-7. The Yard Master stated he did not know about them, but that the crew assigned to Job No. 173 was still working on the track. The Utility Employee told the Yard Master that the cars were stopping and would not go any further because of the grade in the track. The Yard Master then called the Foreman, who did not answer. The Utility Employee walked inside of the trimmer office while the Yard Master was trying to locate the Foreman with his television/security monitor. The Yard Master informed the Utility Employee he could see the Foreman lying on the ground partially under a car on Track No. RD-7. The Utility Employee then ran to his assigned ATV and traveled north on the main road along the yard tracks. When he got near the crossover at Track No. RD-7, he stopped and ran over to where he could see the Foreman lying on the ground. When he arrived, the Foreman was lying face down and had been seriously injured. The Foreman of Job No. 173 was run over by the south truck of Hopper Car, MLLX 10232, which was the south car of the 54 cars being shoved.

The Foreman was transported to the Memphis Regional Medical Center by EMS at 4:05 p.m. and later succumbed to his injuries at 6:08 p.m., CST.

POST-ACCIDENT INVESTIGATION

The crew assigned Job No. 173 had shoved 77 cars on Track No. RD-7 as the last move in building outbound Train H-MEMCVE1-116A. The crew of Job No. 173 then proceeded to make a cut between the 54th and 55th cars to clear the RD-7 crossover. The crew members were pulling north when it was observed that they were not going to clear the crossover and clear the switching lead at the north end of the yard. The Foreman had directed the Engineer, via radio transmission, to shove south six cars to a coupling, and continued directing the move in terms of car lengths to the coupling. The Foreman then directed the Engineer to stop in a normal voice tone. This was when the accident occurred.

The accident was investigated by FRA, the Memphis Area Crime Unit, and BNSF railroad supervisors. The cars and locomotives that were involved were inspected; no defects were disclosed that may have contributed to the accident. The yard locomotives were not equipped with event recorders.

A re-enactment of the accident conducted by BNSF disclosed that the same 23 cars being re-coupled to by the Foreman would stand without rolling away with just one hand brake applied. When the one hand brake was released, the same 23 cars would roll 863 feet and stop on their own. The investigation also disclosed that both knuckles at the coupling were closed. This would indicate that when the Foreman tried to re-couple the 54 cars to the 23 cars, the coupling

did not make, and the knuckles mismatched. During the re-enactment, the 54 cars were shoved into the 23 standing cars at speeds above coupling speed, which is 4 mph. With only one hand brake applied, the 23 cars would roll about 20 feet and stop.

The investigation disclosed that two boot sole prints on top of the east rail matched the boots that the Foreman was wearing at the location where the coupling was attempted. It was also noted that most of the Switchmen in the area wore the same type of safety boots. The distance from where the coupling was attempted and where the Foreman's body was found was 40 feet.

The investigation disclosed that the Foreman was found lying face down, and most of his injuries were down the back of his legs and over his head. The mismatching knuckles on the separated cars, the 23 cars having rolled away 863 feet, and the location of the bodily injuries indicated that the Foreman was struck from the back by Hopper Car MLLX 10232 while releasing the one hand brake on Hopper Car MLLX 105108. The Utility Employee observed the cars rolling on Track No. RD-7.

There were no witnesses to the accident. FRA-mandated, post-accident toxicological tests were conducted for all three crew members. The results of the tests were negative.

APPLICABLE RULES

Burlington Northern TY&E Safety Supplement No. 1 (dated Sunday October 10, 1999)

Rule S-1.1 Job Safety Briefing

Employees must participate in a job safety briefing before beginning work and when work or job conditions change. The briefing includes a discussion of the general work plan, existing or potential hazards, and ways to eliminate or protect against hazards. Outside parties or contractors involved in the work or who are in the work area must also be included in the job safety briefing.

Rule S-13.1.1 Going Between Cars or Locomotives Coupled to Locomotives (in part)

Before going between or working on the end of cars or locomotives, make sure that crew members have a clear understanding of the work to be performed.

Unless positive protection is provided, all crew members must ensure proper safeguards, as listed below, are in place.

When the engine is coupled to the equipment which is not to be moved, the Engineer must center the reverser and fully apply the independent brakes before acknowledgment is made.

The Engineer and other crew members must ensure the equipment being secured will not move until the crew member requesting protection has either reported by radio or hand signal that he or she is no longer between or on the end of equipment.

The crew member going between or working on the end of equipment must wait until all movement of equipment has stopped and the slack has adjusted. If handbrakes are being released, take proper safeguards to ensure slack has adjusted.